

Cognicise Would be Beneficial for the Protection of Cognitive Frailty and Motoric Cognitive Risk (MCR) Syndrome

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Abstract

In recent years, elderly people tend to have mild cognitive impairment (MCI) and physical frailty. For the combination, the concept "cognitive frailty" has been in focus. According to recent study, the incidence risk for long-term care after 2 years showed hazard ratio (HR) 1.0 for healthy subjects, 2.22 for decreased cognitive function, 2.40 for physical frailty, and 3.86 for cognitive frailty, respectively. Recommended exercise is "cognicise", which is a coined word that combines cognition and exercise. For similar concept, Motoric cognitive risk (MCR) syndrome has been also in focus. Cognicise would be useful in current circumstance worldwide.

Keywords: Cognitive frailty; Motoric Cognitive Risk (MCR) syndrome; Mild Cognitive Impairment (MCI); Cognicise; Clinical Dementia Rating (CDR); Physical frailty

3. Editorial

In recent years, the number of elderly people has increased in general clinical practice. Furthermore, mild cognitive impairment (MCI) and physical frailty have become crucial problems for those patients. As to the combination of these problems, the concept "cognitive frailty" has been in focus. This concept was advocated at the International Consensus Conference by the International Academy on Nutrition and Aging (IANA) and the International Association of Gerontology and Geriatrics (IAGG) [1]. When diagnosing cognitive frailty, the patients who show apparent dementia are excluded, and those who are judged by clinical dementia rating (CDR) 0.5 are included with MCI.

Cognitive frailty means a condition in which functions are likely to decline both physically and cognitively, and higher risk would be present needing long-term care or dementia in the future. There was a recent survey that followed up on community-dwelling elderly people aged 65 and over [2]. Among them, the risk of the incidence of long-term care after 2 years was analyzed for 4 groups. As a result, when the standard was 1.0 for healthy subjects, the hazard ratio (HR) was 2.22 for decreased cognitive function alone, HR 2.40 for physical frailty alone, and HR 3.86 for cognitive frailty, respectively.

Another investigation has also been reported. Elderly people living in the community were followed for more than 3 years to investigate the incidence of dementia [3]. As a result, assuming that the healthy subject was HR 1.0, the decreased cognitive function alone was HR 2.06, the physical frailty alone was HR 1.13, and the cognitive frailty was HR 3.34. From the above two reports, it was clarified that cognitive frailty has a higher incidence of long-term care and dementia than single impaired situation of cognitive or physical frailty.

Physical frailty and cognitive decline affect each other in mutually both directions. The risk of dementia was analyzed in cases that were diagnosed as physical frailty by Fried's criteria [4]. The results showed significantly higher levels, which were vascular dementia HR 2.70, Alzheimer's disease HR 1.28, and all dementia HR 1.33 [5]. Conversely, people with cognitive decline are more likely to become frailty. Moreover, the more they progress from CMI to dementia, the more likely they are to become frailty.

The presence of a common basis is suggested between both of frailty and cognitive decline. Among these, the risk of chronic inflammation

would be from interleukin (IL) -6, -8, TNF- α , high-sensitivity CRP [6]. Atherosclerotic influence would be from diabetes, dyslipidemia, hypertension, insulin resistance and so on. In particular, cerebral white matter ischemic lesions, which are one of the pathological conditions of vascular dementia, are attracting attention as a factor connecting both of the pathology [7]. Binswanger's disease is a condition that presents with advanced cerebral white matter ischemic lesions, and has three symptoms: cognitive impairment, gait disturbance, and excretion impairment [8].

Recently, the relationship between frailty syndrome and arteriosclerosis has been also in focus [9]. Elderly people with frailty are more susceptible to atherosclerotic brain disease. Conversely, older people with atherosclerotic cerebrovascular disease have been reported to be more prone to frailty [10]. Therefore, it is fully possible that angiopathy and Atherosclerotic Cardiovascular Disease (ASCVD) are involved in the occurrence and exacerbation of cognitive frailty [11].

In the first place, the purpose of advocating the concept of cognitive frailty is to prevent long-term care and dementia [12]. Factors related to this pathophysiological situation include undernutrition, decreased oral function, weight loss, decreased muscle strength and muscle mass, gait disturbance, and decreased activity. For these impaired functions, appropriate early intervention would be required for possible resources in the society. Social activities and exercises are considered to be important as measures [13]. The recommended exercise for cognitive frailty is "cognicise" [14]. This is a coined word that combines cognition and exercise. One example is playing with words while walking fast, which is a dual exercise [15]. Currently, the research center has been educating and training leaders and practitioners for cognicise, that will be expected spreading further in the future [16].

Regarding the cognitive frailty, there has been a similar concept which is Motoric cognitive risk (MCR) syndrome [17]. MCR is a state

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in which a decrease in walking speed and a decrease in subjective cognitive function are combined, and it is an operationally defined concept similar to cognitive frailty. There are follow-up data for 26,802 people aged 60 and over in a cohort study of 22 locations in 17 countries. As a result, people with MCR had a 1.9 times higher incidence of dementia than others [18]. As to recent study for MCR syndrome, 6371 cases of 65-107 years from Health and Retirement Study (HRS) were evaluated for 4 and 8 years. As a result, older subjective age would bring about 50% higher risk of incident MCR. This result remained similar when other factors were added to analysis, such as physical inactivity, cognition, BMI and depressive symptoms [19].

It has also been reported that MCR has a high risk of not only dementia but also falls, the occurrence of long-term care, and death [20]. It may have similar outcomes to cognitive frailty. Risks of MCR include a history of stroke, depression, decreased physical activity, and obesity [21]. When comparing MCR and cognitive frailty, there is a beneficial point that the former is clinically more convenient. For diagnosis, there are two points: i) to evaluate the deterioration of physical function only by walking speed, and ii) to use checking the deterioration items of cognitive function by 15 items by oneself [22]. It has been observed that cognitive function tends to decline when walking speed decreases in addition to decline in cognitive ability.

Finally, consider the current situation in which COVID-19 is widespread. In the world, activities are restricted and communications/connections with people are restricted. Elderly people are restricted from going out and tend to stay home. Therefore, frailty is likely to progress physically, psychologically and mentally [23]. In such circumstances, cognicise can be applied for the protection against cognitive frailty [24].

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